

REMARKS

Applicant is in receipt of the Office Action mailed July 2, 2004. Claims 29-37 have been amended. Claims 1 - 40 are currently pending in the application. Further consideration of the present case is earnestly requested in light of the following remarks.

Objections

Claims 29-37 were objected to due to incorrect dependencies. These claims have been amended to correct these errors.

Allowed Subject Matter

Applicant appreciates the allowed subject matter of claims 12-13, 26-27, and 39-40. However, Applicant believes that the claims as currently written distinguish over the cited art and are thus allowable, as discussed in detail below.

Section 102 Rejections

Claims 1-4, 6-7, 10-11, 15-18, 20-21, 24-25, 28-31, 33-34, and 37-38 were rejected under 35 U.S.C. 102(b) as being anticipated by Geiser et al (5,797,396, "Geiser"). Applicant respectfully traverses the rejection.

As the Examiner is certainly aware, anticipation requires the presence in a single prior art reference disclosure of each and every element of the claimed invention, arranged as in the claim. *Lindemann Maschinenfabrik GmbH v. American Hoist & Derrick Co.*, 221 USPQ 481, 485 (Fed. Cir. 1984). The identical invention must be shown in as complete detail as is contained in the claims. *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

Claim 1 recites:

1. (Original) A method for locating a point of interest in a region, wherein an approximate model of the region is known, the method comprising:
determining one or more characteristics of a region of interest within the region, wherein said region of interest includes the point of interest;

determining a continuous trajectory based on the one or more characteristics of the region of interest, wherein the continuous trajectory allows measurement of the region of interest;

measuring the region of interest at a plurality of points along the continuous trajectory to generate a sample data set;

performing a surface fit of the sample data set using the approximate model to generate a parameterized surface; and

calculating a location of the point of interest based on the parameterized surface.

The Office Action asserts that Geiser teaches all of the limitations of claim 1. Applicant respectfully disagrees.

For example, in asserting the Geiser teaches *performing a surface fit of the sample data set using the approximate model to generate a parameterized surface*, the Examiner cites Geiser, col. 9, lines 37-49, which reads:

Shown diagrammatically are an inner arc 20 and an outer arc 21 of pixel locations at two selected distances from (x.sub.i, y.sub.j).

Thus, for the 33 radii, the intensity values of the pixels on the radii a pre-set distance from (x.sub.i, y.sub.j) are summed and then subtracted from a similar sum for the next pre-set distance. For example, if each radius is started at inner.sub.-- radius.sub.-- p pixel lengths from (x.sub.i, y.sub.j), and increased by reach.sub.-- p pixels for each arc computation, then the pixel intensities on each radius at inner.sub.-- radius.sub.-- p pixel lengths from (x.sub.i, y.sub.j) are summed to form s.sub.1, then all of the pixel intensities on each radius at inner.sub.-- radius.sub.-- p+reach.sub.-- p pixel lengths are summed to form s.sub.2, etc.

Applicant submits that Geiser nowhere teaches or suggests this feature of claim 1. Rather, in Geiser's system, an ensemble of trajectories, i.e., the plurality of arcs of various radii associated with each pixel in the image region, are exhaustively searched to determine which trajectory (arc) includes the most pixels with high intensities. The center of the determined "best match" trajectory is then computed, and is assumed to approximate the center of the left ventricle. Note that all of the trajectories have the same shape, e.g., a circle or ellipse, and only vary in size, and that this shape is assumed a priori. Applicant further submits that Geiser nowhere teaches or suggests *performing a surface fit of the sample data set using the approximate model to generate a parameterized surface*.

Applicant respectfully submits that the Examiner has improperly characterized Geiser's determined arc as both a trajectory *and* a parameterized surface, and notes that since (in Geiser) they are one and the same, that Geiser specifically does *not* teach generating a parameterized surface by performing a surface fit of the sample data measured along the trajectory, and that, in fact, no *parameterized surface* is generated at all in Geiser.

Applicant also notes that whereas in Applicant's invention, as represented in claim 1, measurements are made at a plurality of points along the continuous trajectory to generate a sample data set, which is then fit using an approximate model of the region to generate a parameterized surface, in Geiser's system, measurements are made at points along *many* trajectories, and the best trajectory (arc) selected as the most likely to represent the left ventricle wall/border. Thus, Geiser actually teaches away from Applicant's invention as claimed, in that in Geiser exhaustive measurements are made along *all* the many trajectories, and the many resultant measurement data sets analyzed to select a representative data set that most closely resembles the a priori specified object (the left ventricle wall). This in direct contrast to the features and limitations of claim 1, wherein data from a single *continuous trajectory* is used to perform a *surface fit to generate a parameterized surface*.

Thus, for at least the reasons provided above, Applicant respectfully submits that Geiser fails to teach or suggest all of the limitations of claim 1, and thus, claim 1 and those claims dependent thereon are patentably distinct and non-obvious over Geiser, and are allowable.

Claims 15 and 28 include similar limitations as claim 1, and so the above arguments apply with equal force to these claims. Thus, Applicant submits that claims 15 and 28, and those claims respectively dependent thereon, are similarly patentably distinct and non-obvious over Geiser, and are also allowable.

Removal of the 102 rejection of claims 1-4, 6-7, 10-11, 15-18, 20-21, 24-25, 28-31, 33-34, and 37-38 is respectfully requested.

Section 103 Rejections

Claims 5, 8-9, 19, 22-23, 32, and 35-36 were rejected under 35 U.S.C. 103(a) as being unpatentable over Geiser, and further in view of Ensz et al (6,100,893, “Ensz”). Applicant respectfully traverse the rejection.

Applicant respectfully submits that since the independent claims have been shown above to be allowable, that their respective dependent claims are also allowable.

Additionally, as the Examiner is certainly aware, to establish a prima facie obviousness of a claimed invention, all claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 U.S.P.Q. 580 (C.C.P.A. 1974), MPEP 2143.03. Obviousness cannot be established by combining or modifying the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion or incentive to do so. *In re Bond*, 910 F. 2d 81, 834, 15 USPQ2d 1566, 1568 (Fed. Cir. 1990).

As held by the U.S. Court of Appeals for the Federal Circuit in *Ecolochem Inc. v. Southern California Edison Co.*, an obviousness claim that lacks evidence of a suggestion or motivation for one of skill in the art to combine prior art references to produce the claimed invention is defective as hindsight analysis.

In addition, the showing of a suggestion, teaching, or motivation to combine prior teachings “must be clear and particular . . . Broad conclusory statements regarding the teaching of multiple references, standing alone, are not ‘evidence’.” *In re Dembicza*k, 175 F.3d 994, 50 USPQ2d 1614 (Fed. Cir. 1999). The art must fairly teach or suggest to one to make the specific combination as claimed. That one achieves an improved result by making such a combination is no more than hindsight without an initial suggestion to make the combination.

Applicant submits that neither Geiser nor Ensz provides a motivation to combine, and that even were the references properly combinable, which Applicant argues they are not, the resulting combination would not produce Applicant’s invention as claimed. For example, both Geiser and Ensz teach away from Applicant’s invention as claimed. Applicant respectfully reminds the Examiner that per *Interconnect Planning Corp. v. Feil*, 774 F.2d 1132, 1143, 227 USPQ 543, 551 (Fed. Cir. 1985), “it is insufficient to

select from the prior art the separate components of the inventor's combination, using the blueprint supplied by the inventor."

As described in the Abstract, Ensz is directed to construction of a solid model from surface point data that represent layers of an object, where the model is represented as the level set of an implicit function that is fitted to the surface point data. Nowhere does Ensz (or Geiser, as argued above) teach or suggest the features and limitations of the independent claims.

In addition, Applicant submits that the rejected dependent claims include numerous features and limitations that are not taught by the cited references. For example, regarding claims 5, 19, and 32, Applicant notes that Ensz's circles, other than being circular, have little or nothing in common with the overlapping circles of claims 5, 19, and 32. For example, the overlapping circles of claim 5 are comprised in a *continuous trajectory which allows sampling of the area of interest*, i.e., a *scan trajectory based on smoothly connected overlapping circles*. In contrast, Ensz's circles are generated by circumscribing Delaunay triangles, which are themselves derived from sampled data. In other words, the circles of Ensz are specifically *not* portions of scan paths used for sampling the region, but conversely, are determined (via Delaunay triangulation) from scanned or measured data. Thus, Ensz teaches away from Applicant's invention as represented in claims 5, 19, and 32.

Thus, for at least the reasons provided above, Applicant submits that neither Geiser nor Ensz, either singly or in combination, teaches or suggests all the features and limitations of claims 5, 19, and 32, and so these claims, and those claims respectively dependent thereon, are non-obvious and patentable over Geiser and Ensz.

Applicant also asserts that numerous other ones of the dependent claims recite further distinctions over the cited art. However, since the independent claims have been shown to be patentably distinct and non-obvious, a further discussion of the dependent claims is not necessary at this time.

Removal of the section 103 rejection of claims 5, 8-9, 19, 22-23, 32, and 35-36 is earnestly requested.

CONCLUSION

In light of the foregoing amendments and remarks, Applicant submits the application is now in condition for allowance, and an early notice to that effect is requested.

If any extensions of time (under 37 C.F.R. § 1.136) are necessary to prevent the above referenced application(s) from becoming abandoned, Applicant(s) hereby petition for such extensions. If any fees are due, the Commissioner is authorized to charge said fees to Meyertons, Hood, Kivlin, Kowert & Goetzel PC Deposit Account No. 50-1505/5150-53400/JCH.

Also enclosed herewith are the following items:

- Return Receipt Postcard
- Check in the amount of \$ _____ for fees (_____).
- Other: _____

Respectfully submitted,



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